

134030 KIT

134734



WCS-134143

Rev A - July 26, 2006

Non-contact Rotary Position Sensor

Features

- Dual Ratiometric APS output
- Independent, Isolated APS circuits
- IP66 Sealed
- Highly EMI resistant (SAE J1113)
- +5V Operation
- -40°C to + 85°C Operation
- Integral Preload Spring
- Integral Metripack 150 Series Connector
- Protected against Electrical Misconnection



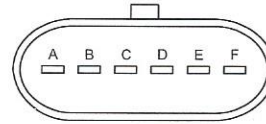
Applications

- Truck Throttle Position Sensor

Description:

This device is a solid-state rotary position sensor that provides a dual linear output voltage proportional to absolute shaft rotation in either direction from a reference angle. It operates from +5V power typically supplied by a vehicle engine control unit (ECU). This device's two outputs are independent and electrically isolated, supporting the implementation of highly fault tolerant and reliable systems.

Connector Pin Configuration



View Facing Connector End

Pin	Function	Pin	Function
A	APS1	D	VCC2 (+5V)
B	GND1	E	GND2
C	VCC1 (+5V)	F	APS2

Mating Connector

Packard Electric "Metri-Pack" Series 150
 Housing p/n: 12066317
 Terminal p/n: 12103884

Williams Controls
 14100 S.W. 72nd Avenue
 Portland, OR. 97224

Preliminary
Subject to Change Without Notice

Phone (503) 684-8600
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Absolute Maximum Ratings

APS Circuits

Supply Voltage (VCC1, VCC2)	-15V to +15V
Output Current (APS1, APS2 output)	+/-10 mA
APS1,2 short circuit duration to ground	20 Minutes max.
APS1,2 short circuit duration to VCC	20 Minutes max.

Whole Sensor

Operating Temperature	-40°C to +85°C
Storage Temperature	-40°C to +125°C

Operation of this device beyond absolute maximum ratings may result in permanent damage.

Electrical Specifications

Over -40°C to +85°C temperature range, $V_{CCx}=5.0V$ unless noted

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Units
$V_{CC1,2}$	APS Supply Voltage		4.5	5	5.5	V
$I_{CC1,2}$	APS Supply Current	Per APS circuit		7	10	mA
V_{DIAG}	APS diagnostic output voltage, selected fault conditions	Broken VCC lead Pull-down load $\geq 20k\Omega$	0		2	%VCC
		Broken VCC lead Pull-up load $\geq 20k\Omega$	0		5	%VCC
		Broken GND lead Pull-down load $\geq 20k\Omega$	93		100	%VCC
		Broken GND lead Pull-up load $\geq 20k\Omega$	98		0	%VCC
		Output short-circuited to GND	0		5	%VCC
		Output short-circuited to VCC	95		100	%VCC
		T_{RECOV}	Recovery time to normal operation from release of selected fault condition	From all fault conditions specified for V_{DIAG}		
I_{OUT}	APS Output Current	For rated operation	-1		1	mA

Mechanical Specifications

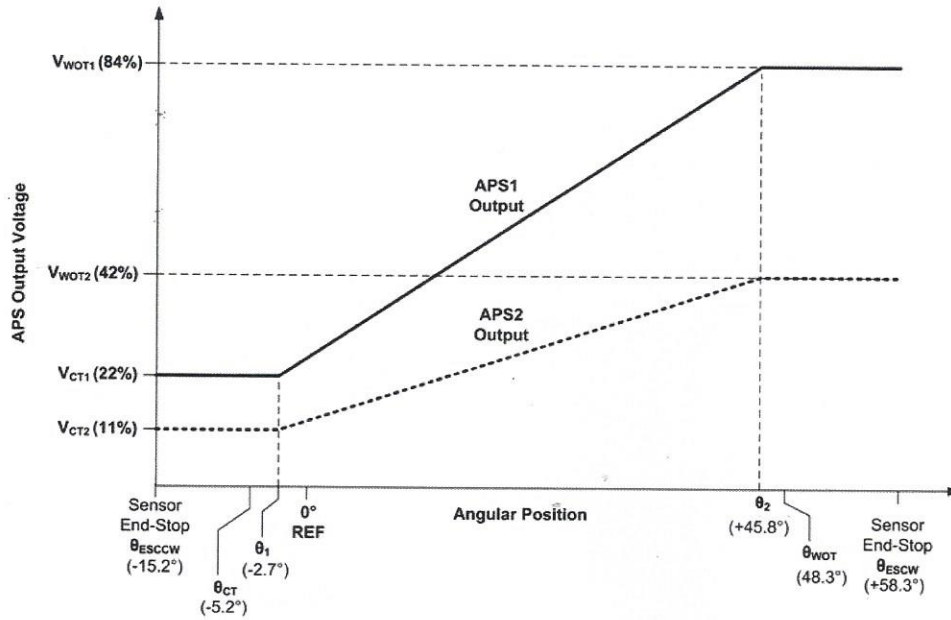
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Units
θ_{ESCCW}	CCW end-stop angle (CT)	From mechanical reference ¹	-17.2	-15.2	-13.2	°
θ_{ESCW}	CW end-stop angle (WOT)	" "	56.3	58.3	60.3	°
	Direction of Rotation	" "		CW		
θ_{CT}	CT reference point	" "		-5.2		°
θ_{WOT}	WOT reference point	" "		48.3		°
θ_1	Lower clamp corner	" "		-2.7		°
θ_2	Upper clamp corner	" "		45.8		°
T_{MNT}	Screw Mounting Torque				25	In-lb
N_{ROT}	Life expectancy rotations	Zero axial, radial load	10 ⁷			
N_{DITH}	Life expectancy dither cycles		8x10 ⁷			
	Seal Rating				IP66	

Notes: 1 - Mechanical reference is defined as line through center of mounting bolt holes, refer to Mechanical Dimensions and Characteristics drawing

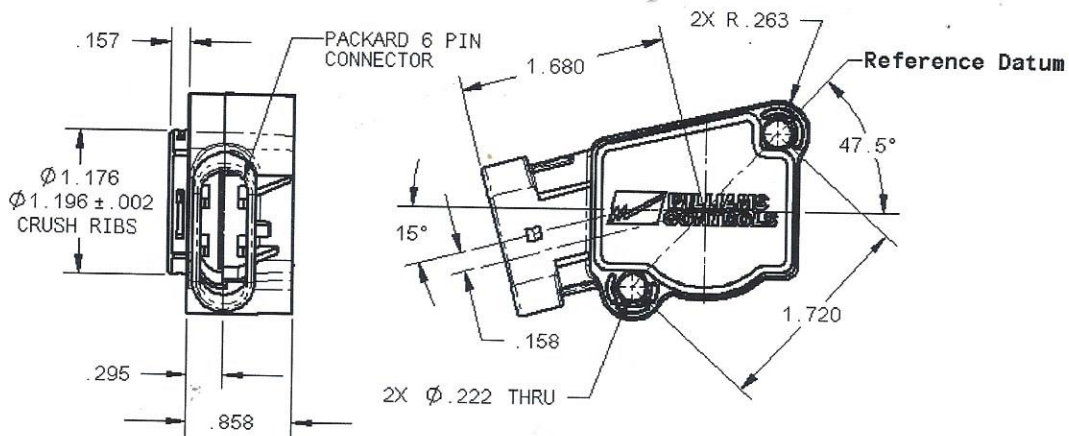
Environmental Validation

Salt Spray:	Refer to Williams Spec WDS-010B
Humidity:	
Chemical Resistance:	
Vibration:	
Thermal Shock:	
EMI Resistance:	Refer to SAE J1113-1

Typical Output Characteristics

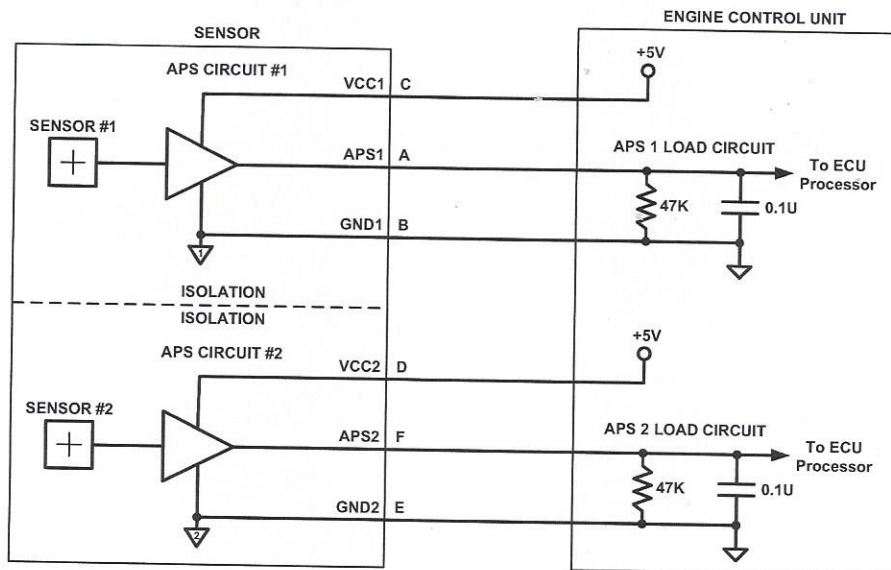


Mechanical Dimensions and Characteristics (for reference only, refer to DWG# 133382)



Applications Information

The following figure shows suggested interconnection and typical compatible ECU internal load circuits. Note that to maintain maximally redundant operation, separate power and ground signals need to be provided to each sensor.



To aid with ECU diagnostic functions, this sensor is specified to output predetermined voltages in the event that power supply lines or the ground lines are broken. The ranges for these voltages is specified in the 'Electrical Specifications' table under the parameter V_{DIAG} . This voltage is specified for a number of fault and loading conditions.